

SECTION IV. THEORY OF OPERATION

8.4.1 INTRODUCTION

This section provides a brief description of how the ASOS pressure sensor functions to sense the ambient barometric pressure. Each ASOS barometric pressure transducer is considered a field replaceable unit (FRU); therefore, only a simplified block diagram description is provided in this chapter. This description is intended to provide basic familiarity with the operation of a pressure transducer and does not describe the detailed operation of the internal electronics of the pressure sensor. Additional information on the operation of the pressure sensor within the ACU is provided in Chapter 2, within the DCP is provided in Chapter 3, and within the Single Cabinet ASOS (SCA) in Chapter 14.

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8.4.2 SIMPLIFIED BLOCK DIAGRAM DESCRIPTION

The ASOS pressure sensor is actually a configuration of separate barometric pressure sensing devices. A simplified block diagram of the ASOS pressure sensor configuration is provided on figure 8.4.1. The ambient barometric pressure is input to each pressure transducer through a shared tygon sensor tube. This ensures that each pressure transducer receives the same barometric pressure input level. A transducer assembly internal to each unit converts the pressure level into an electrical signal level. This level is then monitored and translated by a microprocessor-based circuit within the pressure sensor to produce a barometric pressure value. Each pressure transducer is polled individually by the central processing unit (CPU) and sends its calculated barometric pressure value in a data transfer over an RS-232 interface. This same RS-232 interface provides the means for the CPU to send and receive other commands and data to/from the pressure sensor. Each of the pressure transducers receives its electrical power supply from the power distribution circuit.

As previously described, pressure sensors installed on Class I systems must be equipped with undervoltage threshold detectors. Where internal detectors are not built into the sensor, an external detector is mounted to the power connector (J2) of the sensor. The external detector is then considered part of the sensor itself and should not be removed by the technician.

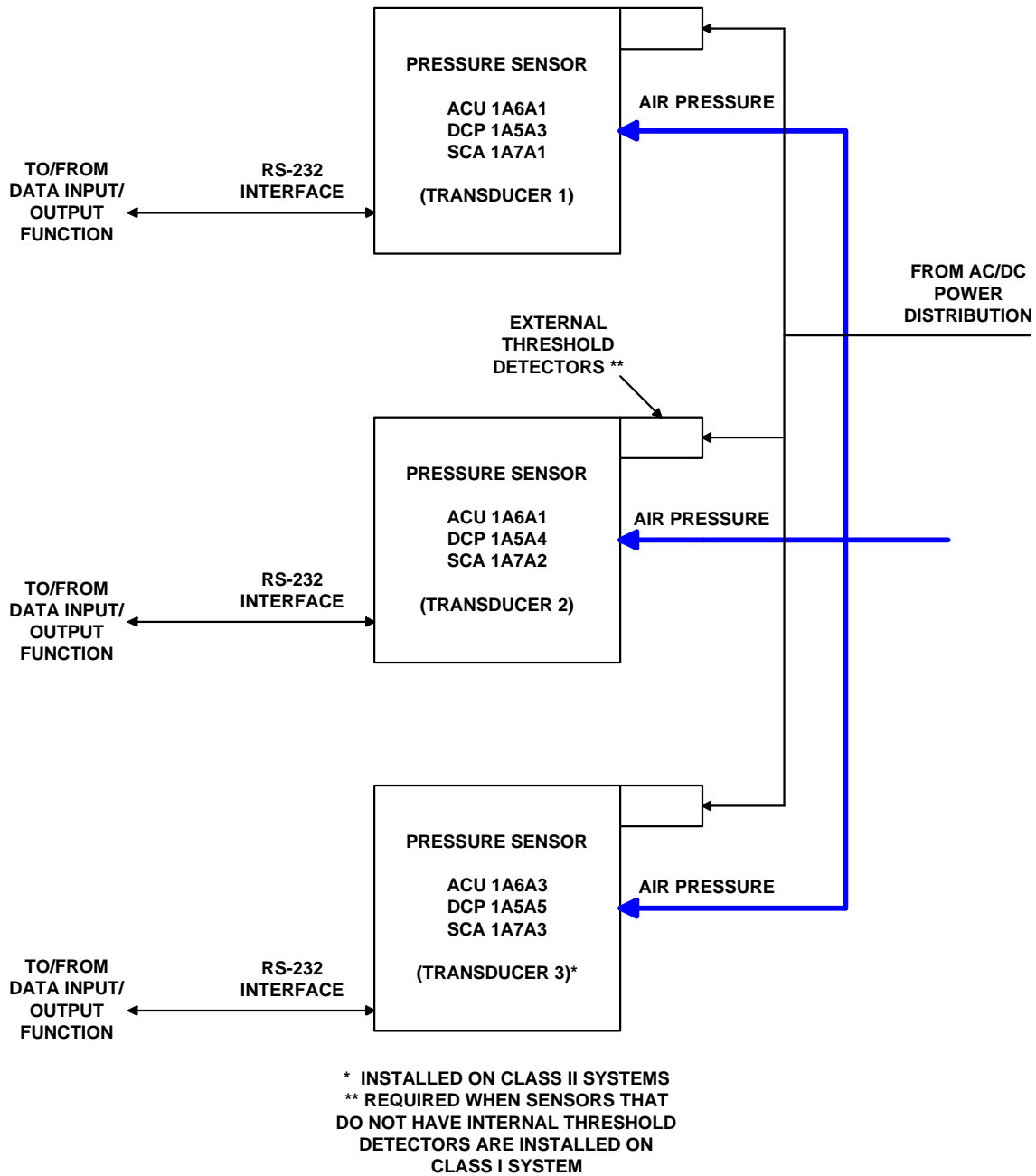


Figure 8.4.1. ASOS Pressure Sensor Simplified Block Diagram